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HS-803 325

PERFORMANCE CHARACTERISTICS OF AUTOMOTIVE ENGINES
IN THE UNITED STATES

First Series - Report No. 15
1975 Dodge Colt 98 CID (1.6 Liters), 2V

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Washington DC 20590

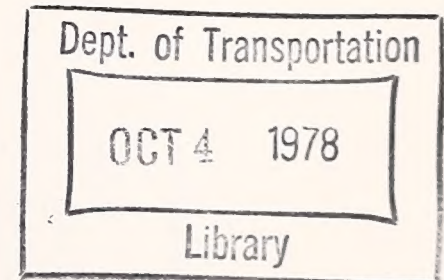
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16. Abstract Experimental data were obtained in dynamometer tests of a 1975 Dodge Colt 1.6 liter (98 CID) engine to determine fuel consumption and emissions (hydrocarbon, carbon monoxide, oxides of nitrogen) at steady-state engine-operating modes. The objective of the program is to obtain engine performance data for estimating emissions and fuel economy for varied engine service and duty. The intent of the work is to provide basic engine characteristic data required as input for engineering calculations involving ground transportation.			
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PREFACE

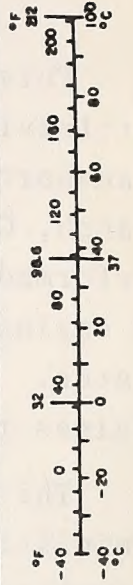
This report was prepared by the U.S. Department of Energy, Bartlesville Energy Research Center, for the U.S. Department of Transportation, Transportation Systems Center, Energy Technology Branch, Cambridge MA. Presented are results of experimental work performed to obtain information on performance characteristics of an engine suitable for use in automobiles sold in the United States. The engine used in this work is one of a series of 23 engines to be tested in the current program.

This project is funded by the National Highway Traffic Safety Administration, Office of Research and Development, Office of Passenger Vehicle Research, Technology Assessment Division.

Ralph G. Colello and James A. Kidd, Jr. of the U.S. Department of Transportation, Transportation Systems Center, are the technical monitors.

METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures				Approximate Conversions from Metric Measures			
Symbol	When You Know	Multiply by	To Find	Symbol	When You Know	Multiply by	To Find
LENGTH				LENGTH			
in	inches	2.5	centimeters	mm	millimeters	0.04	inches
ft	feet	30	centimeters	cm	centimeters	0.4	inches
yd	yards	0.9	meters	m	meters	3.3	feet
mi	miles	1.6	kilometers	km	kilometers	0.6	miles
AREA				AREA			
m ²	square inches	6.5	square centimeters	cm ²	square centimeters	0.16	square inches
ft ²	square feet	0.09	square meters	m ²	square meters	1.2	square yards
yd ²	square yards	0.8	square meters	km ²	square kilometers	0.4	square miles
mi ²	square miles	2.6	square kilometers	ha	hectares (10,000 m ²)	2.5	acres
MASS (weight)				MASS (weight)			
oz	ounces	28	grams	g	grams	0.035	ounces
lb	pounds	0.45	kilograms	kg	kilograms	2.2	pounds
	short tons (2000 lb)	0.9	tonnes	t	tonnes (1000 kg)	1.1	short tons
VOLUME				VOLUME			
teaspoon	teaspoons	5	milliliters	ml	milliliters	0.03	fluid ounces
Tablespoon	tablespoons	15	milliliters	l	liters	2.1	pints
fl oz	fluid ounces	30	milliliters	m ³	cubic meters	1.06	quarts
c	cups	0.24	liters			0.26	gallons
pt	pints	0.47	liters			35	cubic feet
qt	quarts	0.95	liters			1.3	cubic yards
gal	gallons	3.8	liters				
ft ³	cubic feet	0.03	cubic meters				
yd ³	cubic yards	0.76	cubic meters				
TEMPERATURE (exact)				TEMPERATURE (exact)			
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature



1. INTRODUCTION

Data acquired from steady-state tests of a 1975 Dodge Colt 1.6 liter (98 cubic-inch-displacement) engine are presented in this report. This engine is manufactured in Japan by Mitsubishi and is used in compact size vehicles sold in the United States. The test results are sufficient to establish maps of fuel consumption and emissions of carbon monoxide, unburned hydrocarbons, and oxides of nitrogen over the operating range of the engine.

The objective of this program is to obtain basic engine data to be used in predicting the fuel economy and emission characteristics of current production engines operated in various duty cycles.

2. ENGINE TEST REPORT

General engine specifications for a new mean-tolerance Colt engine are given in table 1. A single batch of unleaded regular-grade fuel was used for the entire break-in and testing program. An analysis of the fuel appears in table 2.

Prior to testing, the Colt engine was operated in a vehicle over public roads for a break-in period of approximately 2,000 miles. The engine was then removed from the vehicle, mounted on a test stand, and coupled to an eddy-current dynamometer. All engine accessories except the radiator and fan were transferred to the test stand setup. Engine cooling was provided by an external cooling tower. The electrical requirements of the test stand mounted engine were met by an external battery and recharging system instead of the standard alternator charging system.

Steady-state tests of the engine were made at 11 different speeds to include the entire range of engine operation. Load on the engine was varied in steps from zero to the maximum attainable at each speed. Additionally, the engine was motored by an electric motor at several speeds to simulate closed-throttle decelerations. Table 3 indicates the speed/load combinations tested and may be used as an index to the tabulated data at the end of this report.

The following data were recorded:

Test number
Date
Barometric pressure, mm Hg
Dewpoint, °F
Inlet air temperature, °F
Speed, rpm
Torque, lb-ft -- BLH strain gage load cell; Daytronics indicator
Fuel rate, lb/hr -- Fluidyne positive displacement fuel flowmeter
Ignition timing, °BTC
Manifold vacuum, in. Hg
Throttle angle, deg
CO, pct -- Beckman NDIR
CO₂, pct -- Beckman NDIR
O₂, pct -- Beckman polarographic detector
HC, ppmC -- Custom-built heated flame ionization detector
NO_x, ppm -- Thermo-Electron chemiluminescent detector
Oil temperature, °F
Oil pressure, psig
Coolant temperature, °F
Exhaust temperature, °F
Exhaust pressure, in. H₂O
Intake manifold temperature, °F.

The following equations were used in calculating power, air/fuel ratio, absolute humidity, and mass emission rates of carbon monoxide (CO), unburned hydrocarbons (HC), and oxides of nitrogen (NO_x):

1. Partial pressure of water vapor in intake air (millimeters of mercury):

$$P = \exp \left[18.717 - \frac{7308.1}{393 + D} \right],$$

where D = dewpoint, °F.

2. Absolute humidity (grains moisture per pound dry air):

$$H = \frac{4347.8(P)}{B - P},$$

where B = barometric pressure, mm Hg.

3. Humidity correction factor (dimensionless):

$$K_H = \frac{1}{1 - 0.0047(H - 75)} .$$

Note: This factor is used to correct the NO_x mass emission rate to a standard humidity of 75 grains moisture per pound dry air.

4. Stoichiometric air/fuel ratio (dimensionless):

$$\text{AF}_s = \frac{69(2 + \frac{x}{2} - y)}{\text{MW}_{\text{fuel}}} ,$$

where x = hydrogen-carbon atomic ratio of fuel,
 y = oxygen-carbon atomic ratio of fuel,
 MW_{fuel} = fuel molecular weight per carbon atom,
 $= 12.01115 + 1.00797x + 15.9994y$.

5. Hydrogen concentration in raw exhaust (percent):

$$\text{H}_2 = \frac{x(\text{CO})(\text{CO} + \text{CO}_2)}{2(\text{CO} + 3\text{CO}_2)} ,$$

where CO = carbon-monoxide concentration (percent),
 CO_2 = carbon-dioxide concentration (percent).

Note: This equation assumes a water-gas shift equilibrium constant

$$\frac{(\text{CO})(\text{H}_2\text{O})}{(\text{CO}_2)(\text{H}_2)} = 3 .$$

6. Correction factor for emission concentrations from wet basis to dry basis (dimensionless):

$$C_w = 1 + \frac{(\frac{x}{2})(\text{CO} + \text{CO}_2) - \text{H}_2}{100} .$$

Note: In these tests only HC is measured on a wet basis.
All other species are measured on a dry basis.

7. Air/fuel ratio (dimensionless):

$$AF = \frac{AF_s}{2 + \frac{x}{2} - y} \left[\frac{(1 + \frac{x}{2} - y)(CO) + (2 + \frac{x}{2} - y)(CO_2) + 2(O_2) + \frac{NO_x}{10^4} - H_2}{CO + CO_2 + C_w(\frac{HC}{10^4})} \right],$$

where O_2 = oxygen concentration (percent),

NO_x = oxides of nitrogen (ppm),

HC = unburned hydrocarbon concentration (ppmC).

8. Exhaust flow (pounds per hour):

$$M_{EX} = M_F(1 + AF),$$

where M_F = fuel flow rate (pounds per hour).

9. Carbon monoxide mass emission rate (grams per hour):

$$M_{CO} = \frac{M_{EX}}{C_w} \left(\frac{CO}{100} \right) \left(\frac{MW_{CO}}{MW_{EX}} \right) 453.59237,$$

where MW_{CO} = molecular weight of CO (=28.01115),

MW_{EX} = molecular weight of exhaust gas (=28.967).

10. Unburned hydrocarbon mass emission rate (grams per hour):

$$M_{HC} = M_{EX} \left(\frac{HC}{10^6} \right) \left(\frac{MW_{HC}}{MW_{EX}} \right) 453.59237$$

where MW_{HC} = molecular weight per carbon atom of HC,
 $= 12.01115 + 1.00797x + 15.9994y$.

11. Oxides of nitrogen mass emission rate (grams per hour):

$$M_{NO_x} = \frac{M_{EX}}{C_w} \left(\frac{NO_x}{10^6} \right) \left(\frac{MW_{NO_x}}{MW_{EX}} \right) (K_H) 453.59237,$$

where MW_{NO_x} = molecular weight of NO_2 (=46.0028).

12. Power (brake horsepower corrected to a standard barometric pressure of 736.6 mm Hg and a standard temperature of 85° F):

$$HP = \frac{N(T)}{5252.113} \left(\frac{736.6}{B - P} \right) \sqrt{\frac{t + 460}{545}},$$

where N = engine speed (revolutions per minute),
T = brake torque (foot-pounds),
t = air temperature (°F).

3. DISCUSSION OF TEST RESULTS

The maximum torque and power output (figure 1) measured in this test were somewhat lower than those quoted in table 1. Air/fuel ratio decreased as brake horsepower increased (figure 2). Emissions of CO, HC, and NO_x (figure 3,4, and 5) are typical of well controlled late-model engines. Fuel rate increased as brake horsepower increased (figure 6). Emissions were maintained at low levels for the low-power modes typical of urban driving. Carbon monoxide emissions increased greatly as the air/fuel ratio decreased near wide-open-throttle operation. Hydrocarbon emissions tended to be high during idle and low-power operation, probably because exhaust temperature was too low to permit efficient oxidation by the engine's air injection system.

The repeatability of emission rates, fuel consumption, and engine performance was satisfactory for the purposes of these tests.

4. CONCLUSIONS

The purpose of the experimental work that is reported here is to establish data for this engine. Those data are presented in the accompanying tables of this report.

TABLE 1. MANUFACTURER'S ENGINE SPECIFICATIONS

Displacement, cu. in.....	97.5
Maximum horsepower, bhp @ 5,300 rpm.....	79
Maximum torque, lb-ft @ 3,000 rpm.....	86
Bore and stroke, in.....	3.03 X 3.39
Configuration.....	in-line upright 4-cylinder
Compression ratio.....	8.5
Firing order.....	1-3-4-2
Ignition timing at idle speed, ° @ 850 rpm.....	0
Block material.....	cast iron
Head material.....	cast iron
Number of crankshaft main bearings.....	5
Number of compression rings/piston.....	2
Number of oil rings/piston.....	1
Cam drive type.....	chain and sprocket
Valve lift:	
Intake, in.....	0.375
Exhaust, in.....	0.375
Valve timing:	
Intake opens, °BTC.....	32
Intake closes, °ABC.....	60
Exhaust opens, °BBC.....	63
Exhaust closes, °ATC.....	29
Spark plug gap, inches.....	0.028 to 0.031
Engine weight, lb.....	300
Exhaust-gas-recirculation system:	
Valve type.....	tapered stem
Control signal.....	ported vacuum
Point of discharge.....	intake manifold
Crankcase emission control:	
Control method.....	positive crankcase ventilation
Point of discharge.....	intake manifold and breather
Air-injection system:	
Pump type.....	rotary vane
Control signal.....	ported vacuum
Point of discharge.....	exhaust manifold
Carburetor type.....	2V downdraft
Distributor specifications:	
Centrifugal advance, begins at 500 distributor* rpm.....	0°
Centrifugal advance, full at 3050 distributor rpm.....	28°
Vacuum advance, begins at 6.69 in. Hg.....	0°
Vacuum advance, maximum at 15.75 in. Hg.....	17°
Vacuum retard, begins at 8.66 in. Hg.....	0°
Vacuum retard, maximum at 11.00 in. Hg.....	5°
Carburetor number.....	28-32DIDTA
EGR valve number.....	K5T50271
Distributor number.....	T3T04271

*Distributor rpm = $\frac{1}{2}$ engine rpm.

TABLE 2. FUEL SPECIFICATIONS

Fuel No.....	7619
Research octane No.....	91.5
Motor octane No.....	83.5
Specific gravity.....	0.7160
Reid vapor pressure, psig.....	9.5
Distillation, °F:	
10 pct evaporated.....	128
50 pct ".....	218
95 pct ".....	404
100 pct ".....	417
API gravity, deg.....	66.1
FIA analysis, pct:	
Aromatics.....	6
Olefins.....	17
Paraffins.....	77
Sulfur, pct.....	0.024
Lead, g/gal.....	Trace
Hydrogen/carbon ratio.....	2.040
Oxygen/carbon atomic ratio.....	0.000

TABLE 3. TEST-NUMBER CROSS-REFERENCE INDEX

Pct Full Load	Engine Speed, rpm										
	850	1,000	1,500	2,000	2,500	3,000	3,600	4,000	4,500	5,300	5,500
0	7.1	16.1 83.1	23.1 87.1	30.1 91.1	37.1 95.1	44.1 99.1	51.1 103.1	58.1 107.1	65.1 116.1	72.1 115.1	
10		15.1	22.1	29.1	36.1	43.1	50.1	57.1	64.1	71.1	
25		14.1 82.1	21.1 86.1	28.1 90.1	35.1 94.1	42.1 98.1	49.1 102.1	56.1 106.1	63.1 110.1	70.1 114.1	
50	8.1	13.1	20.1	27.1	34.1	41.1	48.1	55.1		69.1	
60			85.1	89.1	93.1	97.1	101.1	105.1	109.1	113.1	
75		12.1 81.1	19.1	26.1	33.1	40.1	47.1	54.1	61.1	68.1	
90		11.1 80.1	18.1 84.1	25.1 88.1	32.1 92.1	39.1 96.1	46.1 100.1	53.1 104.1	60.1 108.1	67.1	
100	9.1	10.1	17.1	24.1	31.1	38.1	45.1	52.1	59.1	66.1 112.1	133.1
Notored		156.1	157.1	158.1							

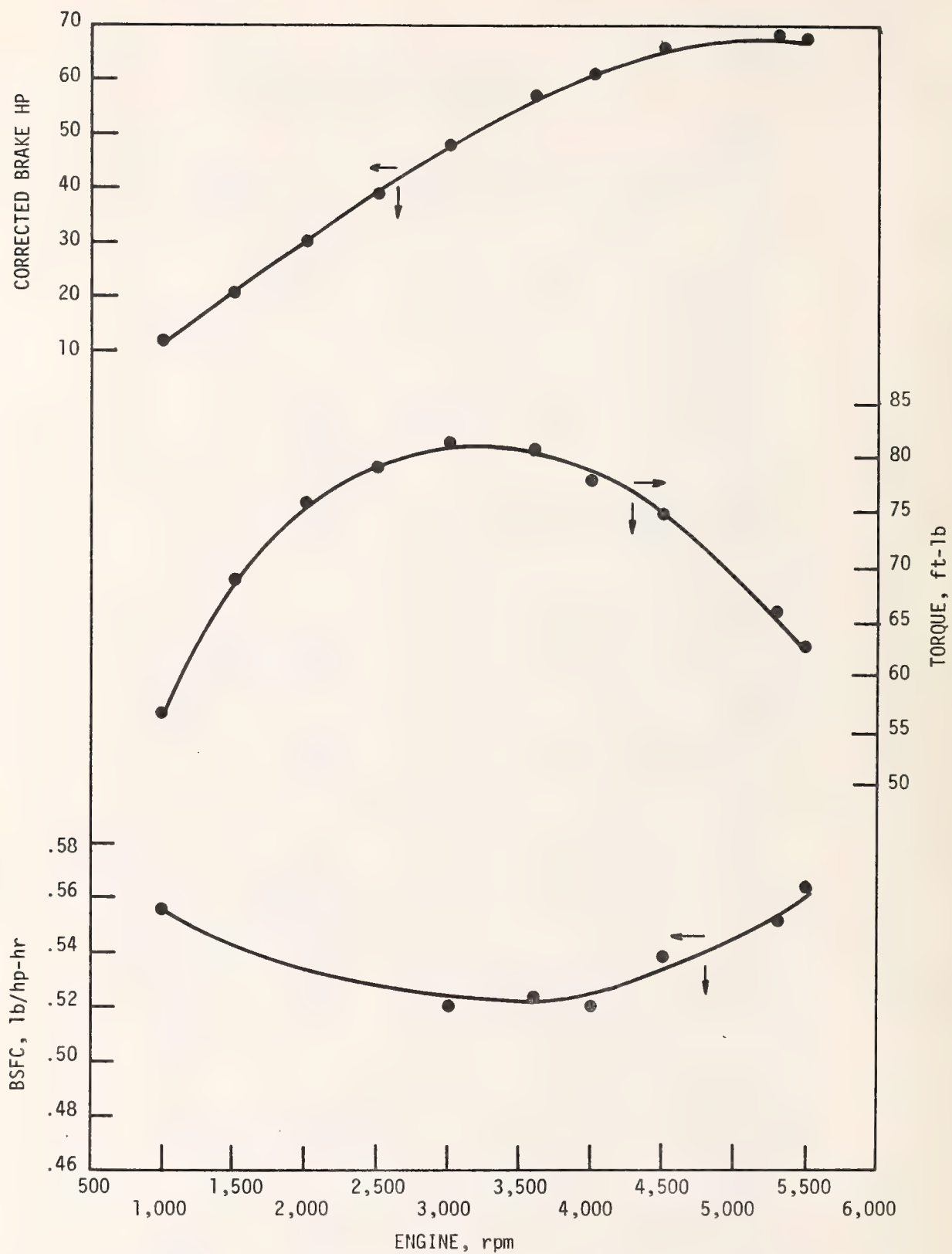


FIGURE 1. Brake Specific Fuel Consumption, Torque, and Brake Horsepower versus Engine rpm at Wide-Open-Throttle--98-CID Colt Engine.

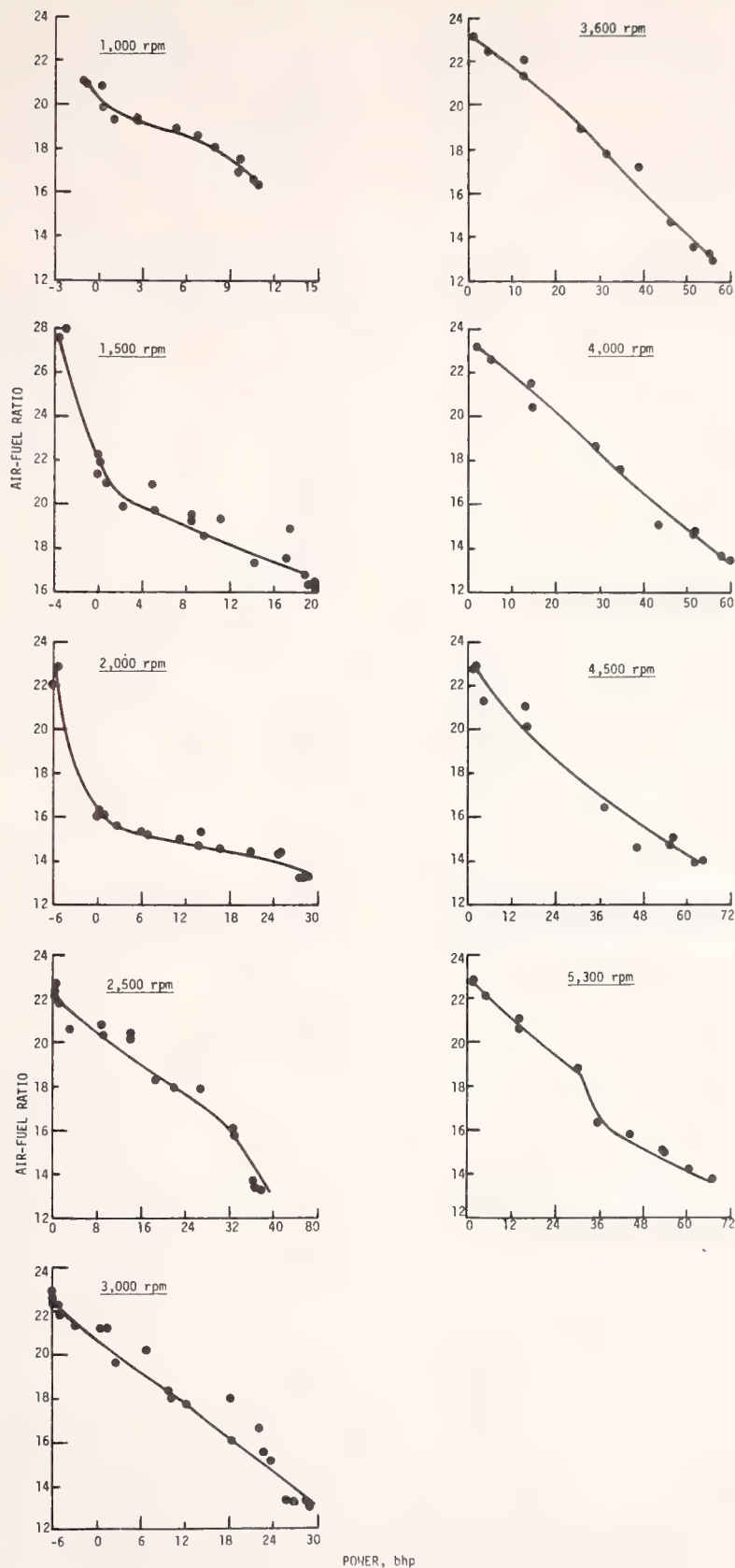


FIGURE 2. Air/Fuel Ratio versus Power at Various Speed and Load Conditions--98-CID Colt Engine.

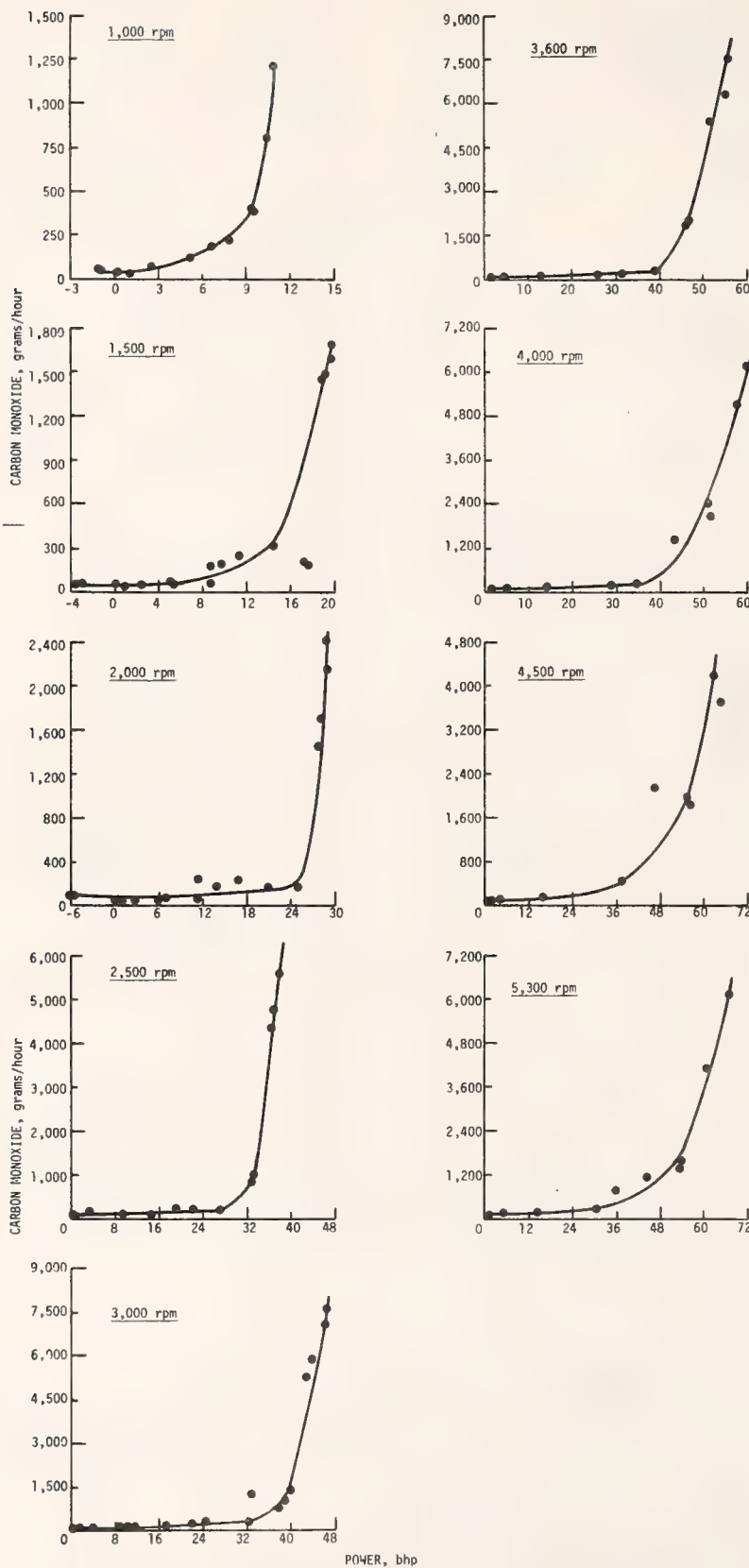


FIGURE 3. Carbon Monoxide Emissions versus power at Various Speed and Load Conditions--98-CID Colt Engine.

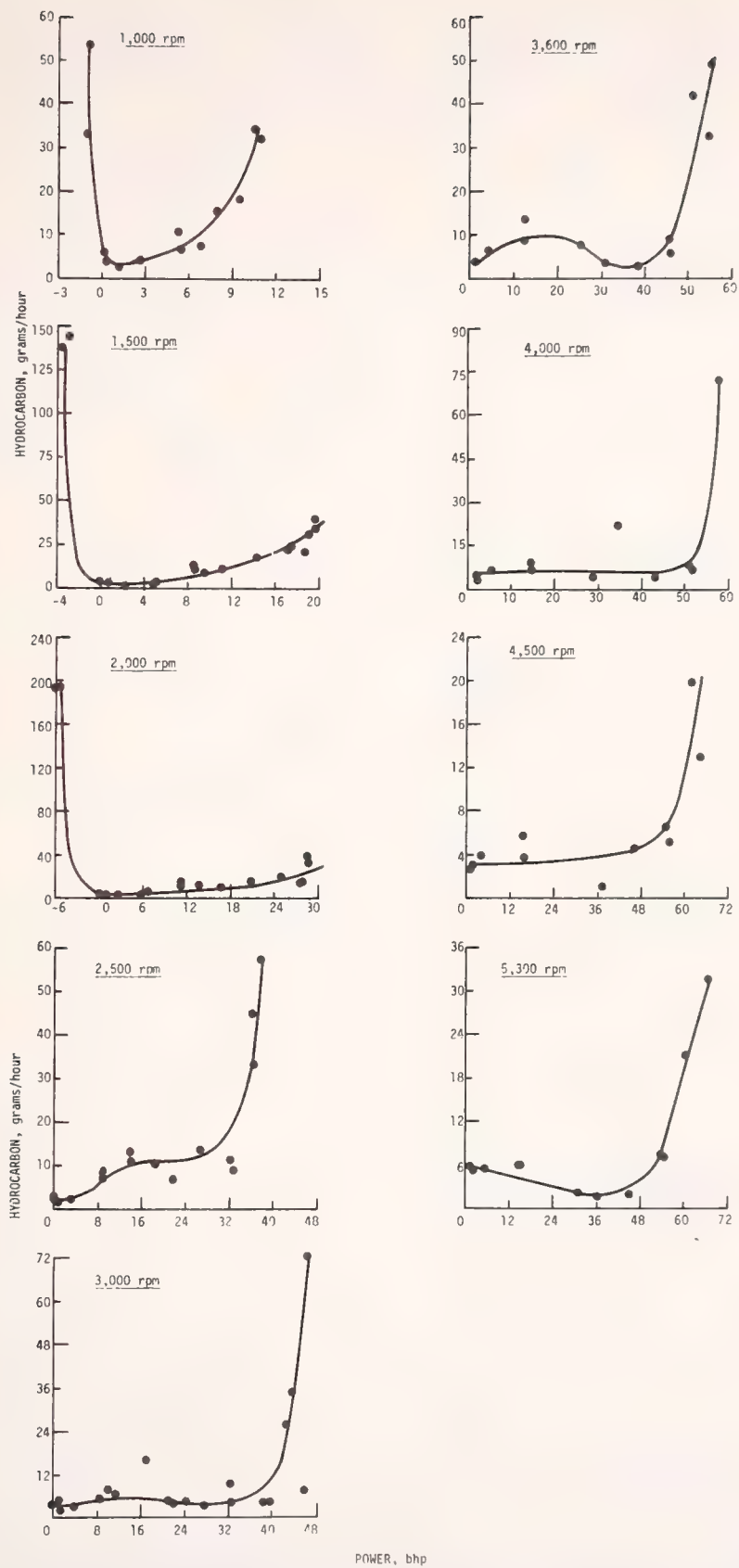


FIGURE 4. Hydrocarbon Emissions versus Power at Various Speed and Load Conditions--98-CID Colt Engine.

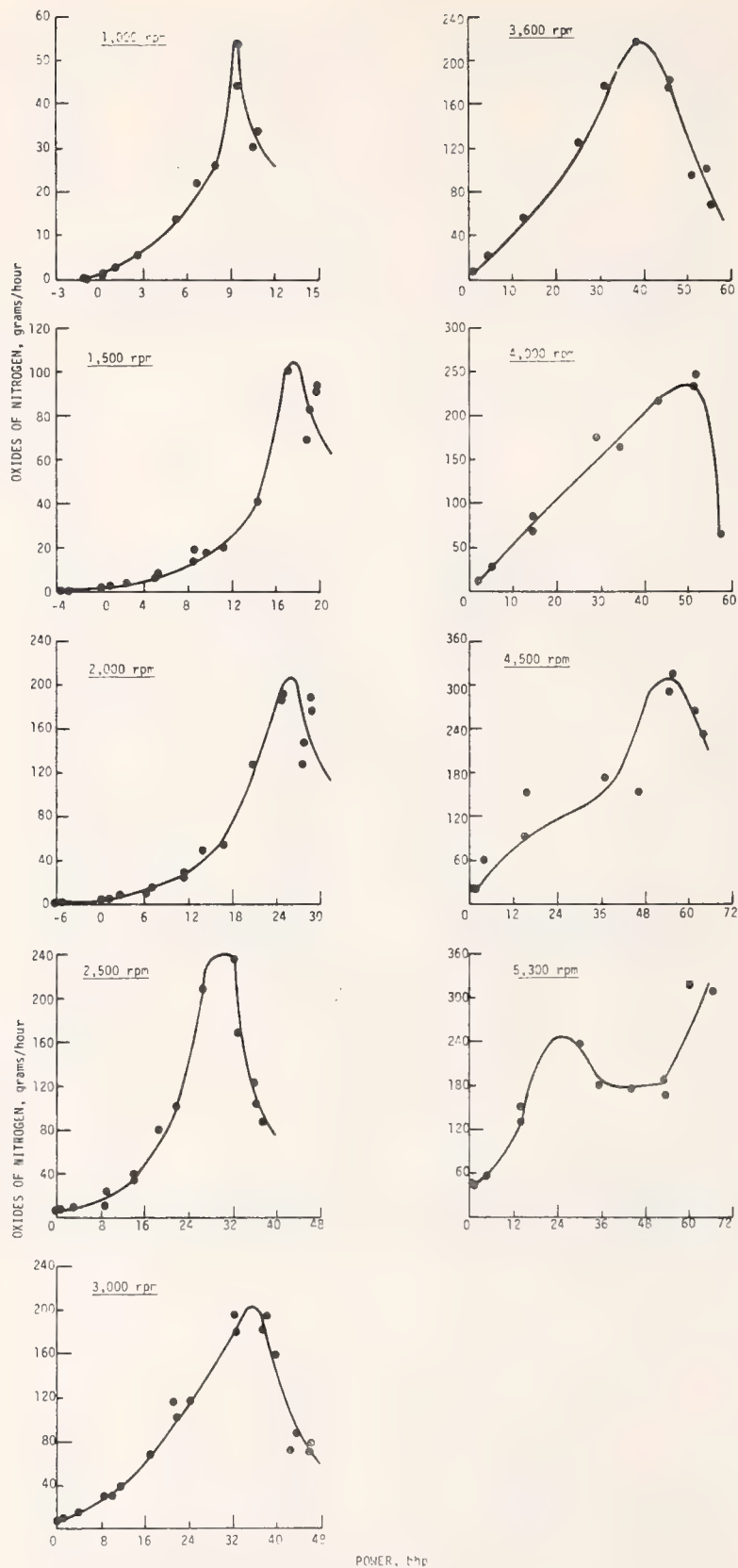


FIGURE 5. Oxides of Nitrogen Emissions versus Power at Various Speed and Load Conditions--98-CID Colt Engine.

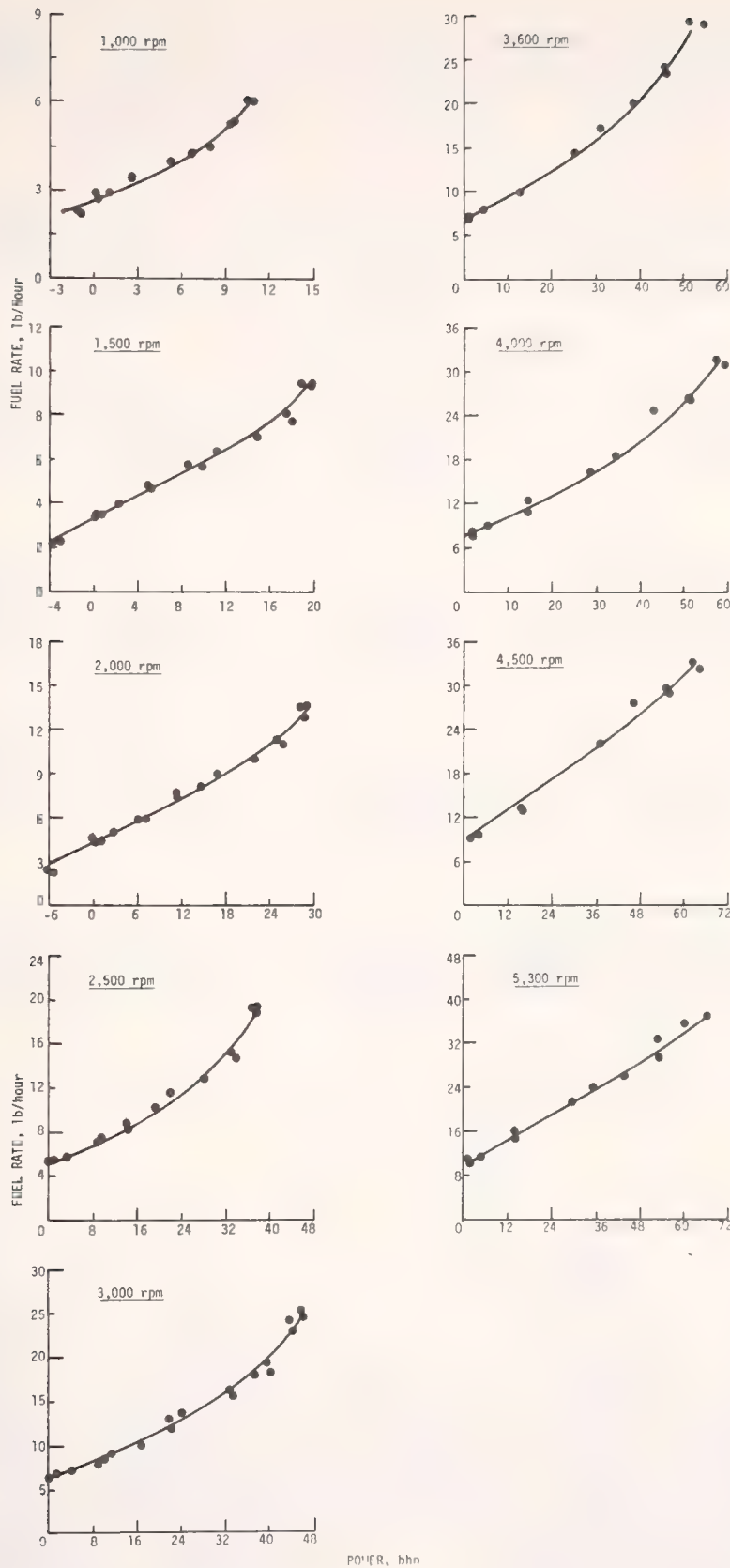


FIGURE 6. Fuel Rate versus Power at Various Speed and Load Conditions--98-CID Colt Engine.

ENGINE CODE COLT98

TEST NUMBER	7.1	8.1	9.1	10.1	11.1	12.1
TEST DATE	7/29/76	7/29/76	7/29/76	7/29/76	7/29/76	7/29/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	741.6	741.6	741.6	741.6	741.6	741.6
HUMIDITY, GRAINS/LB	72	72	72	72	72	72
TEMPERATURE, F	96	97	97	102	95	97
ENGINE SPEED, RPM	850	850	850	1000	1000	1000
TORQUE, FT-LB	1.0	16.0	30.0	54.0	48.6	40.5
POWER, BHP*	.2	2.6	5.0	10.5	9.4	7.9
FUEL RATE, LB/HR	2.2	3.1	3.4	6.1	5.3	4.5
IGNITION TIMING, DEG BTDC	-5.0	-4.0	-1.0	2.0	2.0	2.0
MANIFOLD VACUUM, IN HG	13.6	9.9	7.2	.4	3.2	5.7
THROTTLE ANGLE, DEG	.0	5.0	7.0	71.0	19.0	12.0
INTAKE MAN. TEMP., F	182	157	151	131	137	143

CONCENTRATIONS, DRY BASIS

CO, %	.3598	.5080	.7950	1.8890	1.0780	.6634
CO2, %	10.79	11.33	11.55	10.60	11.55	11.22
O2, %	5.60	4.40	4.10	3.93	3.65	4.60
HC, PPMC	712	615	1123	1624	979	917
NOX, PPM	37	110	205	440	735	480

AIR/FUEL RATIO

AIR/FUEL RATIO	19.40	18.09	17.49	16.68	16.98	18.12
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EMISSION RATES, G/HR

CO	63.9	116.5	196.8	799.2	401.3	221.6
HC	6.4	7.1	14.0	34.5	18.3	15.4
NOX+	1.1	4.1	8.2	30.3	44.5	26.1

OIL TEMPERATURE, F	176	178	182	185	188	188
OIL PRESSURE, PSI	16	17	15	20	19	19
COOLANT TEMPERATURE, F	182	184	183	184	184	183
EXHAUST PRESSURE, IN. H2O	.0	.0	.0	8.0	6.0	4.0
EXHAUST TEMPERATURE, F	746	796	784	964	958	858

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER
 TEST DATE
 FUEL CODE
 BAROMETER, MMHG
 HUMIDITY, GRAINS/LB
 TEMPERATURE, F
 ENGINE SPEED, RPM
 TORQUE, FT-LB
 POWER, BHP*
 FUEL RATE, LB/HR
 IGNITION TIMING, DEG BTDC
 MANIFOLD VACUUM, IN HG
 THROTTLE ANGLE, DEG
 INTAKE MAN. TEMP., F

13.1
 7/29/76
 7619
 741.6
 72
 96
 1000
 27.0
 5.2
 4.0
 0
 8.0
 8.5
 146

14.1
 7/29/76
 7619
 741.6
 72
 97
 1000
 13.5
 2.6
 3.5
 -3.0
 10.9
 6.0
 153

15.1
 7/29/76
 7619
 746.1
 72
 97
 1000
 5.4
 1.0
 2.9
 -5.0
 12.6
 3.5
 162

16.1
 7/29/76
 7619
 746.1
 72
 98
 1000
 1.2
 2
 2.7
 -5.0
 14.0
 2.0
 170

17.1
 7/29/76
 7619
 746.1
 72
 87
 1500
 67.0
 19.2
 9.4
 9.0
 9
 71.0
 131

18.1
 7/29/76
 7619
 746.1
 72
 87
 1500
 60.0
 17.2
 7.8
 9.0
 2.7
 29.5
 140

CONCENTRATIONS, DRY BASIS

CO, %
 CO2, %
 O2, %
 HC, PPMC
 NOX, PPM

3965
 11.01
 5.20
 669
 265

2584
 11.01
 5.30
 279
 120

1465
 11.01
 5.30
 223
 75

1650
 10.60
 5.75
 333
 50

23280
 10.60
 3.75
 1011
 810

AIR/FUEL RATIO

18.96

19.23

19.89

16.34

17.59

EMISSION RATES, G/HR

CO
 HC
 NOX+

125.4
 10.6
 13.6

71.6
 3.9
 5.4

34.4
 2.6
 2.9

1480.2
 32.3
 83.5

198.8
 23.3
 101.3

OIL TEMPERATURE, F
 OIL PPFURE, PSI
 COOLANT TEMPERATURE, F
 EXHAUST PRESSURE, IN. H2O
 EXHAUST TEMPERATURE, F

187
 20
 182
 3.0
 837

186
 20
 181
 0
 848

185
 21
 181
 0
 809

197
 33
 185
 15.0
 1088

198
 31
 184
 12.0
 1065

* CORRECTED SAE J8168
 + CORRECTED FOR HUMIDITY

ENGINE CODE COL198

TEST NUMBER	19.1	20.1	21.1	22.1	23.1	24.1
TEST DATE	7/29/76	7/29/76	7/29/76	7/29/76	7/29/76	7/29/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	746.1	746.1	746.1	746.1	746.1	746.1
HUMIDITY, GRAINS/LB	72	72	72	72	72	72
TEMPERATURE, F	87	87	92	91	91	87
ENGINE SPEED, RPM	1500	1500	1500	1500	1500	2000
TORQUE, FT-LB	50.0	33.5	18.0	8.0	2.8	72.6
POWER, BHP*	14.4	9.6	5.2	2.3	.8	27.8
FUEL RATE, LB/HR	7.1	5.7	4.7	4.0	3.5	12.9
IGNITION TIMING, DEG BTDC	9.0	8.0	6.0	3.0	2.0	13.0
MANIFOLD VACUUM, IN HG	4.7	8.3	12.3	14.8	15.8	1.1
THROTTLE ANGLE, DEG	22.0	15.0	10.5	8.0	6.0	71.0
INTAKE MAN. TEMP., F	144	145	151	162	171	125
CONCENTRATIONS, DRY BASIS						
CO, %	.6125	.4250	.1449	.1430	.1125	1.7935
CO2, %	11.44	10.90	10.40	10.30	9.70	11.78
O2, %	3.65	4.70	5.40	5.50	6.25	1.80
HC, PPMC	728	418	166	94	198	340
NOX, PPM	500	250	138	78	55	975
AIR/FUEL RATIO	17.36	18.58	19.72	19.88	20.95	15.22
EMISSION RATES, G/HR						
CO	311.3	187.7	55.8	46.9	34.2	1457.2
HC	18.6	9.3	3.2	1.5	3.0	13.9
NOX+	41.2	17.9	8.6	4.1	2.7	128.4
OIL TEMPERATURE, F	196	196	194	191	191	191
OIL PRESSURE, PSI	32	33	33	34	34	48
COOLANT TEMPERATURE, F	182	181	183	180	181	181
EXHAUST PRESSURE, IN. H2O	11.0	9.0	8.0	5.0	4.0	21.0
EXHAUST TEMPERATURE, F	1043	996	962	939	918	1212

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER
 TEST DATE
 FUEL CODE
 BAROMETER, MMHG
 HUMIDITY, GRAINS/LB
 TEMPERATURE, F
 ENGINE SPEED, RPM
 TORQUE, FT-LB
 POWER, BHP*
 FUEL RATE, LB/HR
 IGNITION TIMING, DEG BTDC
 MANIFOLD VACUUM, IN HG
 THROTTLE ANGLE, DEG
 INTAKE MAN. TEMP., F

CONCENTRATIONS, DRY BASIS
 CO, %
 CO2, %
 O2, %
 HC, PPMC
 NOX, PPM

AIR/FUEL RATIO

EMISSION RATES, G/HR
 CO
 HC
 NOX+

OIL TEMPERATURE, F
 OIL PRESSURE, PSI
 COOLANT TEMPERATURE, F
 EXHAUST PRESSURE, IN. H2O
 EXHAUST TEMPERATURE, F

25.1	26.1	27.1	28.1	29.1	30.1
7/29/76	7/29/76	7/29/76	7/29/76	7/29/76	7/29/76
7619	7619	7619	7619	7619	7619
746.1	746.1	746.1	746.1	746.1	746.1
72	72	72	72	72	72
87	87	87	87	96	89
2000	2000	2000	2000	2000	2000
65.7	54.8	36.5	18.3	7.3	2.8
25.2	21.0	14.0	7.0	2.8	1.1
11.0	10.0	8.0	5.9	4.9	4.3
13.0	14.0	14.0	14.0	9.0	7.0
2.0	4.2	8.2	13.2	16.1	17.5
42.0	30.0	21.0	13.5	10.0	9.0
130	143	150	150	155	163
2015	2375	3000	1440	1013	1013
12.01	12.01	11.55	11.01	10.30	10.09
4.25	4.40	5.00	6.00	6.75	7.75
472	388	370	200	83	94
1450	1050	500	192	113	76
18.11	18.19	18.75	19.98	21.11	22.19
165.5	178.3	185.6	69.8	43.4	39.9
19.5	14.6	11.5	4.9	1.8	1.9
193.1	127.8	50.1	15.1	7.8	4.9
193	203	206	200	199	196
48	46	44	47	47	48
184	183	182	180	182	181
20.0	17.0	11.0	8.0	4.0	3.0
1143	1179	1111	1037	1014	988

* CORRECTED SAE J816B
 + CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	31.1	32.1	33.1	34.1	35.1	36.1
TEST DATE	7/29/76	7/29/76	7/29/76	7/30/76	7/30/76	7/30/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	746.1	746.1	746.1	741.1	741.1	741.1
HUMIDITY, GRAINS/LB	72	72	72	71	71	71
TEMPERATURE, F	87	87	87	87	87	87
ENGINE SPEED, RPM	2500	2500	2500	2500	2500	2500
TORQUE, FT-LB	76.0	68.4	56.0	39.0	19.0	6.6
POWER, BHP*	36.4	32.7	26.8	18.8	9.2	3.2
FUEL RATE, LB/HR	18.9	14.8	12.9	10.3	7.6	5.9
IGNITION TIMING, DEG BTDC	15.0	15.0	15.0	17.0	19.0	13.0
MANIFOLD VACUUM, IN HG	1.1	2.6	3.7	8.0	13.1	16.2
THROTTLE ANGLE, DEG	71.0	45.0	39.0	23.0	15.0	11.5
INTAKE MAN. TEMP., F	118	133	139	141	153	189
CONCENTRATIONS, DRY BASIS						
CO, %	4.0910	.8805	.2132	.3339	.2011	.3756
CO2, %	11.90	13.01	12.50	11.90	10.70	10.50
O2, %	1.12	2.30	4.07	4.50	6.30	6.70
HC, PPMC	848	228	288	253	267	83
NOX, PPM	710	1500	1363	640	225	108
AIR/FUEL RATIO	13.68	16.04	17.86	18.23	20.32	20.62
EMISSION RATES, G/HR						
CO	4348.4	855.1	201.5	259.3	128.2	189.8
HC	45.3	11.1	13.7	9.9	8.5	2.1
NOX+	122.4	236.2	208.8	80.2	23.1	8.8
OIL TEMPERATURE, F	210	214	214	201	202	206
OIL PRESSURE, PSI	55	53	54	57	58	56
COOLANT TEMPERATURE, F	183	184	183	183	183	182
EXHAUST PRESSURE, IN. H2O	32.0	26.0	24.0	17.0	10.0	8.0
EXHAUST TEMPERATURE, F	1425	1339	1255	1188	1075	1062

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	37.1	38.1	39.1	40.1	41.1	42.1
TEST DATE	7/30/76	7/30/76	7/30/76	7/30/76	7/30/76	7/30/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	741.1	741.1	741.1	741.1	741.1	741.1
HUMIDITY, GRAINS/LB	71	71	71	71	71	71
TEMPERATURE, F	95	87	87	87	87	87
ENGINE SPEED, RPM	2500	3000	3000	3000	3000	3000
TORQUE, FT-LB	1.6	74.0	67.0	56.0	37.0	15.0
POWER, BHP*	.8	42.8	38.7	32.4	21.4	8.7
FUEL RATE, LB/HR	5.4	22.9	18.2	15.6	11.9	7.8
IGNITION TIMING, DEG BTDC	10.0	16.0	16.0	16.0	16.0	19.0
MANIFOLD VACUUM, IN HG	17.3	.8	2.5	4.4	6.9	15.5
THROTTLE ANGLE, DEG	9.5	71.0	47.0	42.0	29.0	14.5
INTAKE MAN. TEMP., F	161	117	130	137	142	153

CONCENTRATIONS, DRY BASIS

CO, %	1036	4.1800	.8706	.2205	.1682	.1420
CO2, %	9.99	12.25	13.26	11.89	11.78	10.19
O2, %	7.20	.40	1.45	4.00	4.30	6.75
HC, PPMC	66	403	64	157	90	133
NOX, PPM	78	360	1050	1050	800	260

AIR/FUEL RATIO

	21.73	13.27	15.44	17.95	18.27	21.12
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EMISSION RATES, G/HR

CO	50.2	5213.2	999.5	254.8	150.7	97.4
HC	1.6	25.2	3.7	9.1	4.0	4.6
NOX+	6.1	72.4	194.5	195.7	115.6	28.8

OIL TEMPERATURE, F	204	192	226	218	223	216
OIL PRESSURE, PSI	57	63	56	61	62	62
COOLANT TEMPERATURE, F	182	187	187	185	184	182
EXHAUST PRESSURE, IN. H2O	6.0	42.0	36.0	28.0	21.0	10.0
EXHAUST TEMPERATURE, F	1054	1570	1456	1307	1279	1086

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	43.1	44.1	45.1	46.1	47.1	48.1
TEST DATE	7/30/76	7/30/76	8/ 2/76	8/ 2/76	8/ 2/76	8/ 2/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	741.1	741.1	748.5	748.5	748.5	748.5
HUMIDITY, GRAINS/LB	71	71	64	64	64	64
TEMPERATURE, F	87	87	88	88	89	88
ENGINE SPEED, RPM	3000	3000	3600	3600	3600	3600
TORQUE, FT-LB	7.0	2.4	75.0	67.0	56.4	37.0
POWER, BHP*	4.0	1.4	51.5	46.0	38.7	25.4
FUEL RATE, LB/HR	7.1	7.0	29.5	24.4	20.1	14.5
IGNITION TIMING, DEG BTDC	18.0	19.0	18.0	18.0	18.0	22.0
MANIFOLD VACUUM, IN HG	16.2	17.1	.9	2.9	4.6	8.9
THROTTLE ANGLE, DEG	12.0	11.0	71.0	56.0	45.0	34.0
INTAKE MAN. TEMP., F	164	164	105	118	126	129
CONCENTRATIONS, DRY BASIS						
CO, %	1325	1084	3.3040	1.2750	.2132	.1465
CO2, %	10.09	9.99	12.25	13.40	13.01	11.55
O2, %	6.80	7.20	.30	.65	3.22	5.00
HC, PPMC	66	44	516	120	36	134
NOX, PPM	140	90	375	775	1000	713
AIR/FUEL RATIO	21.25	21.73	13.51	14.68	17.13	18.93
EMISSION RATES, G/HR						
CO	82.9	68.6	5422.1	1870.3	300.1	166.0
HC	2.1	1.4	42.5	8.9	2.6	7.6
NOX+	14.1	9.2	96.1	177.6	219.9	126.2
OIL TEMPERATURE, F						
OIL TEMPERATURE, F	214	214	217	231	229	224
OIL PRESSURE, PSI	61	62	61	61	61	62
COOLANT TEMPERATURE, F	183	182	186	184	183	182
EXHAUST PRESSURE, IN. H2O	7.0	7.0	65.0	54.0	40.0	25.0
EXHAUST TEMPERATURE, F	1086	1104	1607	1599	1495	1270

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	49.1	50.1	51.1	52.1	53.1	54.1
TEST DATE	8/ 2/76	8/ 2/76	8/ 2/76	8/ 3/76	8/ 3/76	8/ 3/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	748.5	748.5	748.5	751.5	751.5	751.5
HUMIDITY, GRAINS/LB	64	64	64	62	62	62
TEMPERATURE, F	87	87	85	89	91	92
ENGINE SPEED, RPM	3600	3600	3600	4000	4000	4000
TORQUE, FT-LB	18.4	6.2	1.8	76.0	68.0	57.0
POWER, BHP*	12.6	4.3	1.2	57.8	51.8	43.4
FUEL RATE, LB/HR	9.9	8.0	7.3	31.9	26.6	24.9
IGNITION TIMING, DEG BTDC	30.0	28.0	25.0	18.0	18.0	18.0
MANIFOLD VACUUM, IN HG	14.3	16.9	17.6	1.1	2.7	3.6
THROTTLE ANGLE, DEG	26.0	12.0	9.0	71.0	58.0	47.0
INTAKE MAN. TEMP., F	137	145	145	109	118	121
CONCENTRATIONS, DRY BASIS						
CO, %	1180	1108	0844	2.8600	1.2800	.9125
CO2, %	9.89	9.70	9.40	13.14	13.53	13.53
O2, %	7.50	7.75	8.10	.15	.73	.90
HC, PPMC	292	165	99	807	80	51
NOX, PPM	400	190	70	240	1000	920
AIR/FUEL RATIO						
	22.04	22.46	23.11	13.63	14.74	15.03
EMISSION RATES, G/HR						
CO	107.5	82.7	59.3	5075.4	2052.7	1396.9
HC	13.4	6.2	3.5	71.9	6.5	4.0
NOX+	56.9	22.2	7.7	65.9	248.3	218.1
OIL TEMPERATURE, F						
	217	215	194	223	237	237
OIL PRESSURE, PSI						
	63	63	65	62	60	60
COOLANT TEMPERATURE, F						
	182	181	183	186	185	185
EXHAUST PRESSURE, IN. H2O						
	13.0	8.0	6.0	82.0	66.0	59.0
EXHAUST TEMPERATURE, F						
	1097	1068	1035	1669	1633	1616

* CORRECTED SAE J816B

+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	53.1	56.1	57.1	58.1	59.1	60.1
TEST DATE	8/ 3/76	8/ 3/76	8/ 3/76	8/ 3/76	8/ 3/76	8/ 3/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	751.5	751.5	751.5	747.8	747.8	747.8
HUMIDITY, GRAINS/LB	62	62	62	60	60	60
TEMPERATURE, F	92	89	89	88	89	93
ENGINE SPEED, RPM	4000	4000	4000	4000	4500	4500
TORQUE, FT-LB	38.0	19.0	7.0	2.4	73.0	64.0
POWER, BHP*	29.0	14.4	5.3	1.8	62.7	55.2
FUEL RATE, LB/HR	16.6	11.0	9.1	8.1	33.4	29.9
IGNITION TIMING, DEG BTDC	20.0	24.0	17.5	18.0	19.5	19.0
MANIFOLD VACUUM, IN HG	8.8	14.2	16.6	17.8	2.0	2.5
THROTTLE ANGLE, DEG	36.0	28.0	17.0	13.0	74.0	66.0
INTAKE MAN. TEMP., F	131	138	146	156	110	118
CONCENTRATIONS, DRY BASIS						
CO, %	1132	1084	988	984	2.1900	1.0880
CO2, %	11.55	9.99	9.50	9.31	13.27	13.67
O2, %	4.60	7.00	7.75	8.10	.20	.63
HC, PPMC	62	176	148	110	207	72
NOX, PPM	890	460	210	95	890	1050
AIR/FUEL RATIO	18.65	21.53	22.64	23.19	13.99	14.77
EMISSION RATES, G/HR						
CO	145.0	106.7	84.9	65.9	4183.7	1959.7
HC	4.0	8.7	6.4	4.3	19.9	6.5
NOX+	176.5	70.1	27.9	11.4	263.7	291.2
OIL TEMPERATURE, F	233	227	224	221	228	237
OIL PRESSURE, PSI	61	62	63	64	62	61
COOLANT TEMPERATURE, F	183	182	184	183	186	183
EXHAUST PRESSURE, IN. H2O	34.0	17.0	10.0	9.0	95.0	86.0
EXHAUST TEMPERATURE, F	1349	1155	1091	1111	1686	1672

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER
 TEST DATE
 FUEL CODE
 BAROMETER, MMHG
 HUMIDITY, GRAINS/LB
 TEMPERATURE, F
 ENGINE SPEED, RPM
 TORQUE, FT-LB
 POWER, BHP*
 FUEL RATE, LB/HR
 IGNITION TIMING, DEG BTDC
 MANIFOLD VACUUM, IN HG
 THROTTLE ANGLE, DEG
 INTAKE MAN. TEMP., F

61.1
 8/ 3/76
 7619
 748.3
 60
 91
 4500
 54.0
 46.4
 27.8
 20.0
 4.3
 54.0
 128

63.1
 8/ 3/76
 7619
 747.3
 60
 89
 4500
 18.6
 16.0
 13.1
 32.0
 13.3
 35.0
 143

64.1
 8/ 3/76
 7619
 747.3
 60
 90
 4500
 4.8
 4.1
 9.6
 34.0
 17.2
 29.0
 154

65.1
 8/ 3/76
 7619
 747.8
 70
 110
 4500
 2.0
 1.8
 9.1
 33.0
 17.8
 29.0
 158

66.1
 8/ 4/76
 7619
 747.3
 67
 108
 5300
 59.0
 60.8
 36.0
 21.0
 1.8
 72.0
 123

CONCENTRATIONS, DRY BASIS

CO, %
 CO2, %
 O2, %
 HC, PPMC
 NOX, PPM

1.2750
 13.67
 .55
 55
 600

1156
 9.99
 6.75
 88
 470

.0820
 9.31
 7.80
 66
 150

1.9700
 13.27
 .35
 201
 970

.6454
 13.53
 .75
 69
 580

AIR/FUEL RATIO

14.62

20.16

21.29

22.89

14.18

15.04

EMISSION RATES, G/HR

CO
 HC
 NOX+

2116.4
 4.6
 153.3

129.3
 3.7
 106.3

98.2
 3.8
 61.5

71.1
 2.9
 20.9

4108.2
 21.0
 320.6

1324.0
 7.1
 188.6

OIL TEMPERATURE, F
 OIL PRESSURE, PSI
 COOLANT TEMPERATURE, F
 EXHAUST PRESSURE, IN. H2O
 EXHAUST TEMPERATURE, F

233
 61
 182
 70.0
 1686

232
 62
 178
 21.0
 1248

228
 63
 176
 11.0
 1141

226
 64
 179
 9.0
 1128

251
 70
 185
 79.0
 1686

208
 70
 184
 64.0
 1666

* CORRECTED SAE J816B
 + CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	68.1	69.1	70.1	71.1	72.1	80.1
TEST DATE	8/ 4/76	8/ 4/76	8/ 4/76	8/ 4/76	8/ 4/76	8/ 2/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	747.3	747.3	747.3	747.3	747.3	744.8
HUMIDITY, GRAINS/LB	67	67	67	67	67	65
TEMPERATURE, F	88	88	87	86	87	87
ENGINE SPEED, RPM	5300	5300	5300	5300	5300	1000
TORQUE, FT-LB	44.0	30.0	14.0	5.0	1.8	50.0
POWER, BHP*	44.6	30.4	14.2	5.1	1.8	9.6
FUEL RATE, LB/HR	26.6	21.6	16.2	11.7	10.8	5.4
IGNITION TIMING, DEG BTDC	20.5	21.0	22.0	21.5	27.0	1.0
MANIFOLD VACUUM, IN HG	5.9	7.8	9.7	12.6	12.9	3.0
THROTTLE ANGLE, DEG	37.0	32.0	30.0	25.5	24.0	24.0
INTAKE MAN. TEMP., F	128	130	132	138	147	134

CONCENTRATIONS, DRY BASIS

CO, %	.6276	.1420	.1156	.1084	.0964	.9984
CO2, %	13.00	11.78	10.40	9.50	9.31	11.55
O2, %	1.75	4.85	6.25	7.25	7.75	4.15
HC, PPMC	19	24	89	99	99	337
NOX, PPM	650	900	690	320	255	880

AIR/FUEL RATIO

	15.79	18.76	20.59	22.13	22.82	17.51
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EMISSION RATES, G/HR

CO	1079.8	237.5	159.8	117.6	98.9	387.3
HC	1.7	2.0	6.1	5.4	5.1	6.6
NOX+	177.2	238.5	151.1	55.0	41.5	53.8

OIL TEMPERATURE, F	239	230	219	220	224	175
OIL PRESSURE, PSI	70	70	70	70	70	21
COOLANT TEMPERATURE, F	183	183	174	181	181	184
EXHAUST PRESSURE, IN. H2O	60.0	44.0	31.0	22.0	18.0	7.0
EXHAUST TEMPERATURE, F	1646	1450	1214	1135	1132	885

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER
 TEST DATE
 FUEL CODE
 BAROMETER, MMHG
 HUMIDITY, GRAINS/LB
 TEMPERATURE, F
 ENGINE SPEED, RPM
 TORQUE, FT-LB
 POWER, BHP*
 FUEL RATE, LB/HR
 IGNITION TIMING, DEG BTDC
 MANIFOLD VACUUM, IN HG
 THROTTLE ANGLE, DEG
 INTAKE MAN. TEMP., F

81.1
 8/ 2/76
 7619
 744.8
 65
 87
 1000
 35.0
 6.7
 4.3
 1.0
 7.0
 15.0
 142

82.1
 8/ 2/76
 7619
 744.8
 65
 87
 1000
 13.6
 2.6
 3.4
 -4.0
 11.0
 10.0
 151

83.1
 8/ 4/76
 7619
 744.8
 65
 86
 1000
 .4
 .1
 2.9
 -6.0
 10.5
 7.0
 166

84.1
 8/ 4/76
 7619
 744.8
 65
 86
 1500
 61.4
 17.6
 8.1
 8.0
 2.3
 34.0
 136

85.1
 8/ 3/76
 7619
 744.8
 65
 86
 1500
 39.0
 11.2
 6.4
 8.0
 5.6
 21.0
 148

86.1
 8/ 4/76
 7619
 744.8
 65
 86
 1500
 17.0
 4.9
 4.8
 5.0
 11.8
 14.0
 161

CONCENTRATIONS, DRY BASIS

CO, %
 CO2, %
 O2, %
 HC, PPMC
 NOX, PPM

.5584
 11.21
 5.05
 436
 420

.2724
 11.11
 5.50
 301
 128

.1420
 10.09
 6.50
 464
 22

.2789
 10.90
 5.00
 779
 430

.4750
 10.60
 5.50
 467
 250

.1560
 10.09
 6.50
 128
 100

AIR/FUEL RATIO

19.35

20.86

18.92

19.33

20.91

EMISSION RATES, G/HR

CO
 HC
 NOX+

186.6
 7.3
 22.1

74.4
 4.1
 5.5

35.5
 5.8
 .9

178.2
 25.0
 43.3

244.9
 12.1
 20.3

64.8
 2.7
 6.5

OIL TEMPERATURE, F
 OIL PRESSURE, PSI
 COOLANT TEMPERATURE, F
 EXHAUST PRESSURE, IN. H2O
 EXHAUST TEMPERATURE, F

182
 20
 182
 5.0
 798

180
 21
 181
 4.0
 812

182
 21
 175
 1.0
 814

185
 30
 180
 10.0
 1032

194
 30
 178
 8.0
 984

190
 31
 179
 5.0
 927

* CORRECTED SAE J816B
 + CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER

TEST DATE

FUEL CODE

BAROMETER, MMHG

HUMIDITY, GRAINS/LB

TEMPERATURE, F

ENGINE SPEED, RPM

TORQUE, FT-LB

POWER, BHP*

FUEL RATE, LB/HR

IGNITION TIMING, DEG BTDC

MANIFOLD VACUUM, IN HG

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

CONCENTRATIONS, DRY BASIS

CO, %

CO2, %

O2, %

HC, PPMC

NOX, PPM

AIR/FUEL RATIO

EMISSION RATES, G/HR

CO

HC

NOX+

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

* CORRECTED SAE J8168
+ CORRECTED FOR HUMIDITY

87.1	88.1	89.1	90.1	91.1	92.1
8/ 4/76	8/ 4/76	8/ 4/76	8/ 4/76	8/ 4/76	8/ 4/76
7619	7619	7619	7619	7619	7619
744.8	742.8	742.8	742.8	742.8	742.5
65	67	67	66	66	66
86	86	86	86	86	86
1500	2000	2000	2000	2000	2500
.6	65.0	44.0	16.0	.8	69.0
.2	25.0	16.9	6.1	.3	33.1
3.5	11.3	9.0	5.8	4.3	15.4
1.0	11.0	12.0	12.0	11.0	14.0
16.4	2.1	6.2	13.2	17.3	2.5
9.0	41.0	26.0	16.0	11.0	44.0
181	129	143	160	179	126
.1672	.2015	.3500	.1232	.1013	1.0160
9.31	11.66	11.22	10.50	9.31	12.75
7.00	3.85	4.50	6.00	7.75	2.00
126	459	262	155	131	176
23	1425	500	120	45	1075
21.92	17.87	18.41	20.25	22.79	15.76
53.5	167.7	240.0	60.3	41.9	1010.8
2.0	19.2	9.0	3.8	2.7	8.8
1.2	188.4	54.5	9.3	2.9	168.7
188	199	202	199	196	197
28	42	42	44	45	55
177	181	180	178	177	183
3.0	18.0	13.0	5.0	2.0	27.0
873	1162	1142	1018	971	1330

ENGINE CODE COLT98

TEST NUMBER	93.1	94.1	95.1	96.1	97.1	98.1
TEST DATE	8/ 4/76	8/ 4/76	8/ 4/76	8/ 4/76	8/ 4/76	8/ 4/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	742.5	742.5	742.5	742.5	742.5	742.5
HUMIDITY, GRAINS/LB	66	66	66	66	66	66
TEMPERATURE, F	87	86	86	87	87	86
ENGINE SPEED, RPM	2500	2500	2500	3000	3000	3000
TORQUE, FT-LB	45.8	18.6	.8	65.6	42.4	17.6
POWER, BHP*	22.0	8.9	.4	37.8	24.4	10.1
FUEL RATE, LB/HR	11.6	7.3	5.4	17.9	13.5	8.4
IGNITION TIMING, DEG BTDC	14.0	19.0	10.0	15.0	15.0	22.0
MANIFOLD VACUUM, IN HG	5.8	13.0	17.2	3.0	6.6	13.7
THROTTLE ANGLE, DEG	32.0	19.0	14.0	45.0	32.0	16.0
INTAKE MAN. TEMP., F	139	158	172	132	140	153
CONCENTRATIONS, DRY BASIS						
CO, %	.2750	.1785	.0900	.6125	.2750	.1560
CO2, %	11.78	10.30	9.50	13.01	12.01	10.09
O2, %	4.00	6.50	7.75	2.75	3.75	6.75
HC, PPMC	151	210	88	45	84	188
NOX, PPM	750	100	50	950	750	260
AIR/FUEL RATIO	17.93	20.75	22.66	16.52	17.68	21.15
EMISSION RATES, G/HR						
CO	236.3	111.8	46.1	741.7	271.3	115.2
HC	6.5	6.6	2.3	2.8	4.2	7.0
NOX+	101.6	9.9	4.0	181.4	116.7	30.3
OIL TEMPERATURE, F	208	201	196	215	211	207
OIL PRESSURE, PSI	51	57	57	59	60	61
COOLANT TEMPERATURE, F	181	179	177	182	182	179
EXHAUST PRESSURE, IN. H2O	20.0	10.0	4.0	31.0	23.0	11.0
EXHAUST TEMPERATURE, F	1243	1050	1001	1432	1279	1068

* CORRECTED SAE J8168

+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	99.1	100.1	101.1	102.1	103.1	104.1
TEST DATE	8/ 4/76	8/ 5/76	8/ 5/76	8/ 5/76	8/ 5/76	8/ 5/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	742.5	741.6	741.6	741.6	741.6	741.6
HUMIDITY, GRAINS/LB	66	67	67	67	67	67
TEMPERATURE, F	86	86	89	87	86	88
ENGINE SPEED, RPM	3000	3600	3600	3600	3600	4000
TORQUE, FT-LB	.6	67.0	45.0	18.0	1.4	66.4
POWER, BHP*	.3	46.4	31.2	12.5	1.0	51.2
FUEL RATE, LB/HR	6.5	23.6	17.3	10.1	7.0	26.7
IGNITION TIMING, DEG BTDC	16.0	17.0	19.5	30.0	31.0	18.0
MANIFOLD VACUUM, IN HG	16.6	2.9	5.1	14.7	16.6	2.5
THROTTLE ANGLE, DEG	14.0	40.0	32.0	18.0	16.0	49.0
INTAKE MAN. TEMP., F	171	121	138	153	174	126
CONCENTRATIONS, DRY BASIS						
CO, %	.0900	1.4200	.1769	.1277	.0892	1.4900
CO2, %	9.50	13.67	12.26	10.30	9.50	13.66
O2, %	7.60	.60	3.80	7.00	8.20	.70
HC, PPMC	104	80	51	188	110	95
NOX, PPM	54	825	890	400	80	930
AIR/FUEL RATIO	22.50	14.59	17.74	21.30	23.12	14.63
EMISSION RATES, G/HR						
CO	55.2	1994.6	223.0	114.2	60.5	2377.4
HC	3.2	5.7	3.2	8.4	3.7	7.6
NOX+	5.2	184.2	178.3	56.9	8.6	235.9
OIL TEMPERATURE, F	201	197	224	219	212	226
OIL PRESSURE, PSI	62	65	60	61	64	61
COOLANT TEMPERATURE, F	180	184	183	179	179	185
EXHAUST PRESSURE, IN. H2O	8.0	45.0	35.0	11.0	6.0	65.0
EXHAUST TEMPERATURE, F	1065	1545	1389	1135	1080	1626

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	105.1	106.1	107.1	108.1	109.1	110.1
TEST DATE	8/ 5/76	8/ 5/76	8/ 5/76	8/ 5/76	8/ 5/76	8/ 5/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	741.6	741.6	741.6	741.6	741.6	741.6
HUMIDITY, GRAINS/LB	67	67	67	67	67	67
TEMPERATURE, F	89	88	88	89	91	88
ENGINE SPEED, RPM	4000	4000	4000	4500	4500	4500
TORQUE, FT-LB	45.0	19.0	2.6	65.0	43.0	18.0
POWER, BHP*	34.7	14.6	2.0	56.4	37.4	15.6
FUEL RATE, LB/HR	18.7	12.5	7.9	29.2	22.2	13.2
IGNITION TIMING, DEG BTDC	18.0	23.0	25.0	20.0	20.0	23.0
MANIFOLD VACUUM, IN HG	5.8	11.8	17.4	2.3	6.1	12.9
THROTTLE ANGLE, DEG	38.0	36.0	21.0	53.0	41.0	27.0
INTAKE MAN. TEMP., F	141	138	167	123	138	146
CONCENTRATIONS, DRY BASIS						
CO, %	1465	1325	0820	1.0100	2875	1180
CO2, %	12.40	10.70	9.40	13.53	13.14	10.40
O2, %	3.65	6.30	8.10	1.05	2.40	6.75
HC, PPMC	316	131	93	57	14	100
NOX, PPM	770	510	95	1100	725	510
AIR/FUEL RATIO	17.58	20.44	23.12	15.09	16.45	21.04
EMISSION RATES, G/HR						
CO	198.3	139.9	62.4	1820.7	431.0	135.6
HC	21.5	6.9	3.6	5.2	1.0	5.7
NOX+	165.7	85.6	11.5	315.2	172.8	93.2
OIL TEMPERATURE, F	231	201	221	226	239	216
OIL PRESSURE, PSI	60	65	63	62	60	64
COOLANT TEMPERATURE, F	183	182	181	185	182	183
EXHAUST PRESSURE, IN. H2O	42.0	19.0	8.0	80.0	55.0	22.0
EXHAUST TEMPERATURE, F	1467	1165	1111	1622	1568	1242

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER

TEST DATE	112.1	113.1	114.1	115.1	133.1	156.1
FUEL CODE	8/ 5/76	8/ 5/76	8/ 5/76	8/ 5/76	8/24/76	10/ 8/76
BAROMETER, MMHG	7619	7619	7619	7619	7619	7619
HUMIDITY, GRAINS/LB	741.6	741.6	741.6	741.6	745.0	750.0
TEMPERATURE, F	67	67	67	67	59	48
ENGINE SPEED, RPM	90	91	91	91	88	82
TORQUE, FT-LB	5300	5300	5300	5300	5500	1000
POWER, BHP*	53.0	35.0	14.0	1.2	63.0	-6.0
FUEL RATE, LB/HR	54.2	35.8	14.3	1.2	66.3	1.1
IGNITION TIMING, DEG BTDC	29.8	24.4	15.0	11.0	37.6	2.3
MANIFOLD VACUUM, IN HG	22.0	23.5	25.0	26.0	24.0	-6.0
THROTTLE ANGLE, DEG	2.4	7.4	12.6	16.4	3.0	16.0
INTAKE MAN. TEMP., F	56.0	42.0	33.0	26.0	71.0	.0
	121	134	143	149	121	188

CONCENTRATIONS, DRY BASIS

CO, %	.8514	.4608	.1084	.0940	3.1500	.2480
CO2, %	13.53	12.88	10.30	9.50	13.26	9.70
O2, %	.77	2.30	6.75	7.90	.10	7.25
HC, PPMC	74	17	88	104	312	3302
NOX, PPM	580	700	630	260	1000	10

AIR/FUEL RATIO

	14.96	16.30	21.12	22.81	13.57	21.10
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EMISSION RATES, G/HR

CO	1552.1	753.5	142.4	98.8	6550.6	49.9
HC	6.8	1.4	5.8	5.5	32.6	33.4
NOX+	168.1	182.0	131.6	43.5	318.9	.3

OIL TEMPERATURE, F

OIL PRESSURE, PSI	224	235	244	231	245	167
COOLANT TEMPERATURE, F	64	60	60	62	58	25
EXHAUST PRESSURE, IN. H2O	186	186	172	183	187	172
EXHAUST TEMPERATURE, F	96.0	64.0	30.0	16.0	109.0	3.0
	1624	1578	1271	1150	1678	740

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	157.1	158.1
TEST DATE	10/ 8/76	10/ 8/76
FUEL CODE	7619	7619
BAROMETER, MMHG	750.0	750.0
HUMIDITY, GRAINS/LB	48	48
TEMPERATURE, F	82	82
ENGINE SPEED, RPM	1500	2000
TORQUE, FT-LB	-13.0	-16.5
POWER, BHP*	3.7	6.2
FUEL RATE, LB/HR	2.2	2.3
IGNITION TIMING, DEG BTDC	1.0	4.0
MANIFOLD VACUUM, IN HG	20.2	22.5
THROTTLE ANGLE, DEG	0	0
INTAKE MAN. TEMP., F	195	178

CONCENTRATIONS, DRY BASIS

CO, %	2205	2635
CO2, %	6.98	4.40
O2, %	12.50	14.70
HC, PPMC	10727	10466
NOX, PPM	10	7

AIR/FUEL RATIO

	27.54	37.05
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EMISSION RATES, G/HR

CO	57.2	97.6
HC	139.9	194.6
NOX+	4	4

OIL TEMPERATURE, F	177	181
OIL PRESSURE, PSI	39	54
COOLANT TEMPERATURE, F	179	178
EXHAUST PRESSURE, IN. H2O	2.0	3.0
EXHAUST TEMPERATURE, F	685	567

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

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